

# Contents
















Unit One

**LESSON 1** | **Friction**

## What's meant by friction?



### Friction force

- It is the effect that exists between two surfaces when they touch each other and it effects in the opposite direction of the movement.

**OR**

- It is the force that slows down the motion of an object.

### Factors affecting friction force

1. The surface area of the moving object

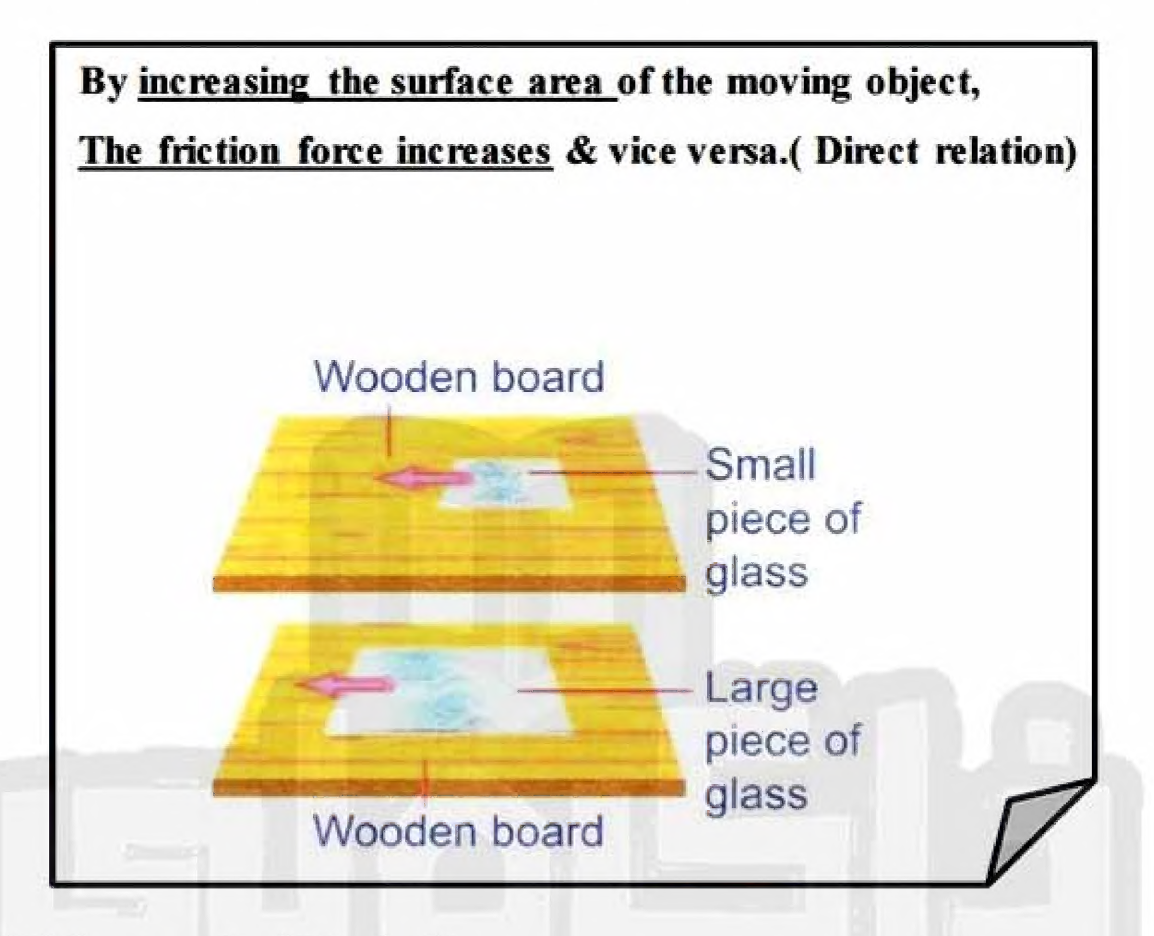
2. The speed of the body.

3. The type of the material surface

### 1) The surface area of the moving object:

**By increasing the surface area of the moving object,**

**The friction force increases & vice versa.( Direct relation)**

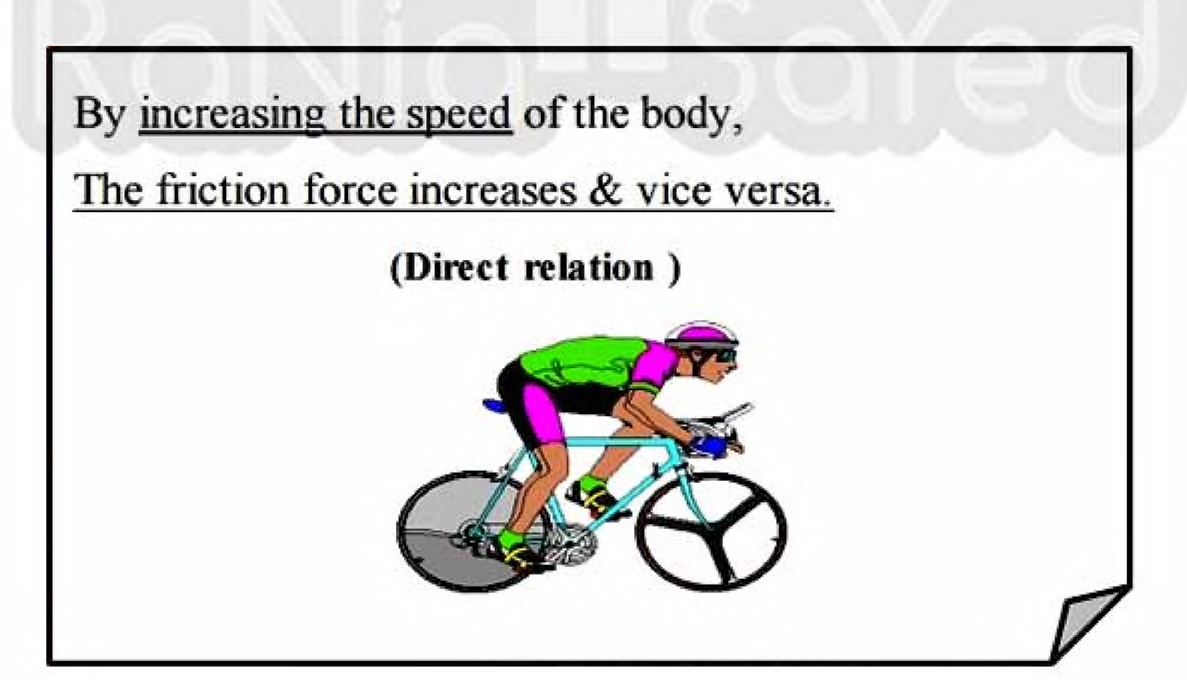



### 2) The speed of the body:

By increasing the speed of the body,

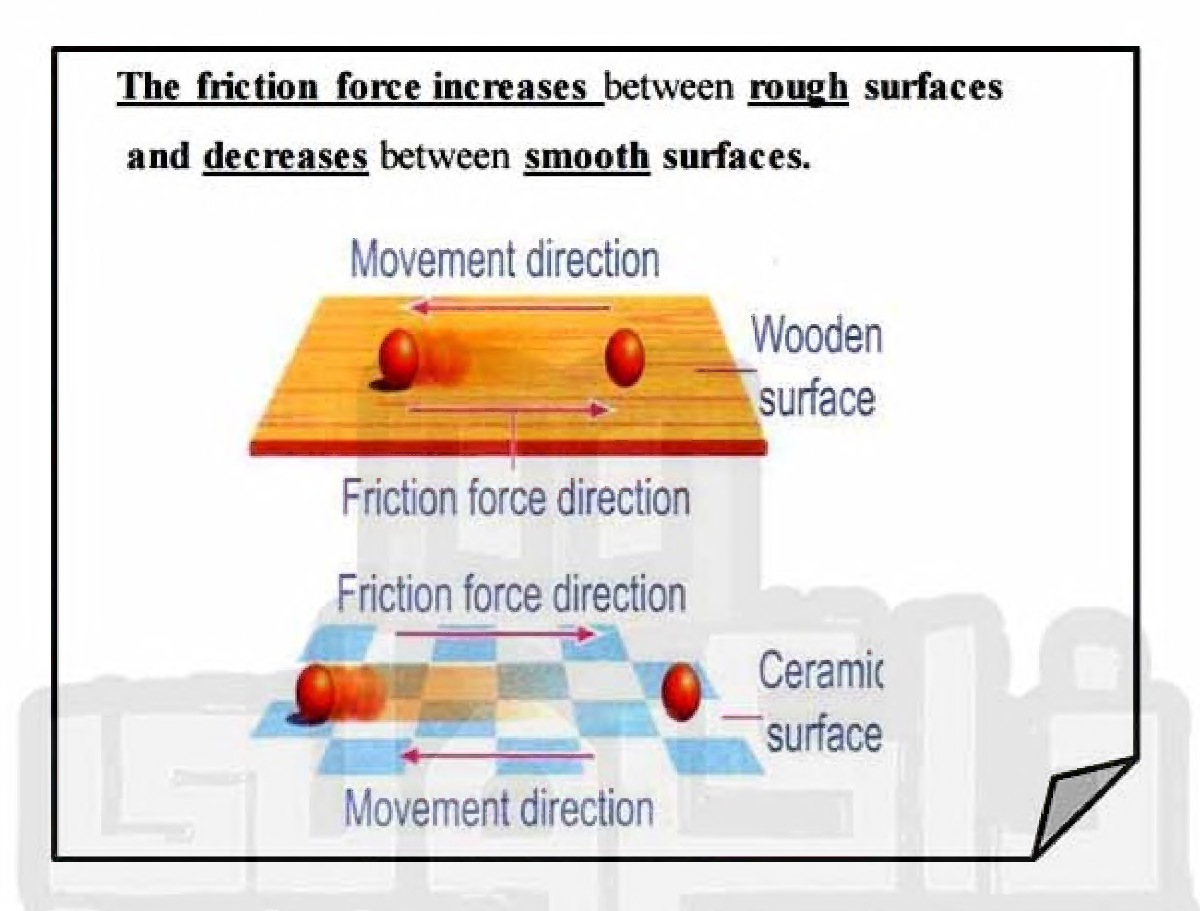
The friction force increases & vice versa.

**(Direct relation )**



### 3) Type of the material surface:

**The friction force increases** between **rough surfaces** **and decreases** between **smooth surfaces.**






### The disadvantage of friction

1-Rise in the temperature of the internal parts of the machines.

2-Damage of internal parts of the machines.



## Ways to decrease the friction force

### 1) Oil and lubricants

- They form a thin layer between the internal parts of machines.

**Ex:** Using lubricants and oil in car engine.




### 2) Using ball bearing.

- **A group of small metallic balls which have smooth surfaces.**
- The friction between them is almost non- existent.

**Ex** : The axis that transmits the motion from the car engine into the wheels.




Ball bearing

# Evaluation

## 1 Write the scientific term:

1-A force result between two surfaces touch each other and affect in the opposite direction. (……………………………)
2-A group of small metal balls which have smooth surfaces is put between the internal moving parts of machines. (……………………………)
3-The force that slows down the moving object and it affects in the opposite direction of the object movement (……………………………)

## 2 Complete:

1-The friction force increases between ……………….surfaces and……… between smooth surfaces
2-Lubricating and oiling the mechanical machines reduce the ………

## 3 Give reason for:

1-There is a direct relation between the friction force and the surface area of moving object .

……………………………………………………………………………………………

2-when you stop pedaling during the movement of the bike,it slows down .

……………………………………………………………………………………………

3-the marble move in the playground for a shorter distance than that on playground .

……………………………………………………………………………………………

4-the friction between glass and glass is smaller than that between glass and wood .

……………………………………………………………………………………………

# Homework

## 1 Complete

1- The friction force has an effect in the opposite direction of ………………….. .

2- Friction is a …….. occurs between two surfaces when one of them touches the other and affect in the …….. direction of the moving objects.

3- ………..… force changes with changing the type of two surfaces touching each other.

4- When the car moves with high velocity…………… increases.

5- ……………and ……………. are used in the mechanical machines to decrease the friction force.

6- The friction between two solid objects increase by increasing ……………….…

7- …………….. increases by increasing the surface area of a moving object.

8- The reason of stopping a ball after pushing it on the ground is ……………………



## 2 Put (√) or ( X ) :

1-The friction force exists in the same direction of body motion. (   )

2-The friction force between two surfaces is greater while moving than stopping. (   )

3- When the parachutist opens the parachute, the friction force decreases. (   )

4- Ball bearing is used to increase friction force. (   )

5- Lubricants and oil are used to decrease friction force. (   )

6- Regulation of car movement on the road by the friction between the tires and ground. (   )

7- The friction force increases by decreasing the speed of the body. (   )

8- Friction has high harms which cause damage of machine. (   )



Unit one

LESSON 2

# Friction Applications

## 1-The friction between solid objects and air.



### Air Resistance:

- It is the friction force resulting from the movement of solid objects through air.

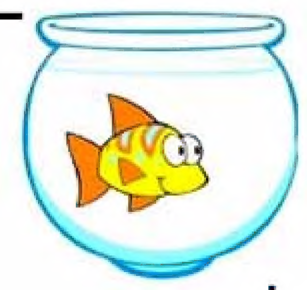
Direction of movement



Direction of Air resistance

## 2-The friction force between solid objects and water:

**Water Resistance:**



It is a type of friction force resulting from
The movement of objects through water.

Direction of water resistance

Direction of movement

## The factors affecting air & water resistance:

### 1) Surface area of moving body:

- By increasing the surface area of the body the air resistance & the water resistance increases and vice versa.






(Low air resistance) (High air resistance)




- The modern cares have ***streamline shape*** to decrease the consumption of fuel.



**G.R:**

**1-Rockets and aircrafts have streamline shapes.**

To decrease the air resistance.









## G.R:

**2-Fish and ships have streamline shape**
**To decrease the water resistance**

## Notes:

Birds stretch their wings on landing to **increase air resistance** By **increasing their surface area** and accordingly their falling **Speed decreases**.

The parachutist opens the parachute to **increase air resistance** by **increasing the surface area** and accordingly falling speed **decreases** so he falls safely.

## 2) Speed of moving body:

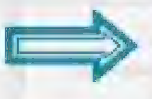
- By *increasing the speed* of the body that moves through air, *air resistance increases.*





**G.R:**

**Car drivers shouldn't increase the car speed up to a certain limit.**



**To decrease the air resistance and the consumption of fuel.**




When **air resistance** affecting a moving car **equals** the **increase in the speed** of the car, the car moves with a **constant velocity.**

## The advantages of friction





| 1-It enables us to walk without slipping down. | 2. It enables us to control the car speed and to change the car direction. | 3- Lighting of a match needs friction. |
|---|---|---|

## Applications on friction between two solid objects



**Rubber tires** are designed with:

1) **Narrow channels** along their perimeter. (Why?)

-To prevent water from staying between tires and the road.

2) These channels are connected with **curved grooves** (why?)

-To squeeze the water out.

**G.R:**

**Car tires should be replaced when their grooves disappear.**

Because grooves are necessary to squeeze the water out,
as water decreases friction and makes the control of the car very hard.

# Evaluation

## 1 Complete

1- The friction force between air and the object that moves through is called ……………
2- By increasing the ……………..and ………………..of the body , the air resistance increases .
3- Air resistance acts in the ……………..of the car movement and resists its movement .
4- Parachutist opens the parachute during landing to increase its ……………… that increases ……………… .
5- When the air resistance is equivalent to the increasing in the movement force , the body moves with …………… .
6- The rubber tires have narrow channels along their perimeter to ……………… .
7- Rockets and ……………….. are designed in streamline shapes to ……………………………………………

## 2 Answer the following :

**1)What are the factors affecting on the air resistance ?**

……………………………………………………………………………………
……………………………………………………………………………………
……………………………………………………………………………………
……………………………………………………………………………………

## 3 Give reasons for

1) Birds stretch their wings on landing.

……………………………………………………………………………………
……………………………………………………………………………………

2) The parachutist opens the parachute while landing.

……………………………………………………………………………………
……………………………………………………………………………………

# Homework

## 1 What's meant by :

**1-Air resistance ?**

......................................................................................

......................................................................................

......................................................................................

**2-Water resistance?**

......................................................................................

......................................................................................

......................................................................................

## 2 Answer the following :

**Mention two ways to decrease water resistance ?**

1-......................................................................................

2-......................................................................................

## 3 Write the scientific term:

1-A force opposes the motion of a boat in the river.

(..............................)

2-A force enable us to control the car speed and to change its direction.

(..............................)

3-It is the friction force resulting from the movement of solid objects through air (..............................)




# LESSON 1 Circulatory system

## The circulatory system:

It is the system that transports the digested food, Oxygen gas and water to all the body cells and carries the wastes away from the body cells.

## Its function

1-It transports the digested food, Oxygen gas and water to all the body cells.

2-It transports wastes produced by the body cells to special organs to get rid of them

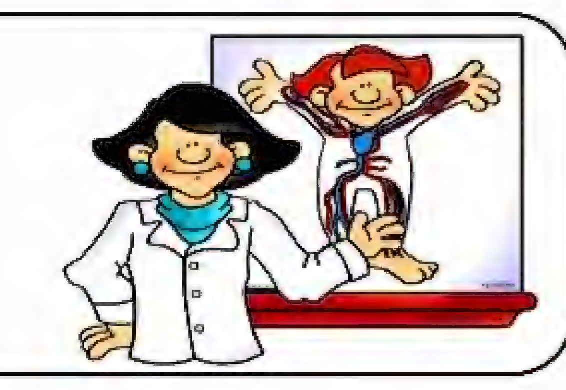
3- It helps in maintaining the body healthy.

## Its structure

**1) Heart**

**2) Blood vessels**

**3) Blood**



## 1-The Heart

It is a muscular hollow organ equals about the size of your fist.

### It's Location

It locates inside the chest cavity between the two lungs.

### Its function

It pumps the blood continuously throughout the body

### Heart structure

1-The heart consists of **four chambers (rooms)** located in two sides (Right side and left side).

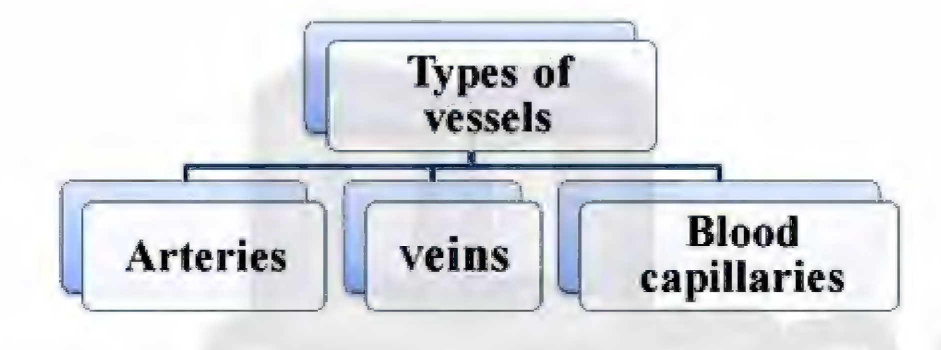
2-The upper chamber in each side is called (**atrium**) and the lower chamber is called (**ventricle**).

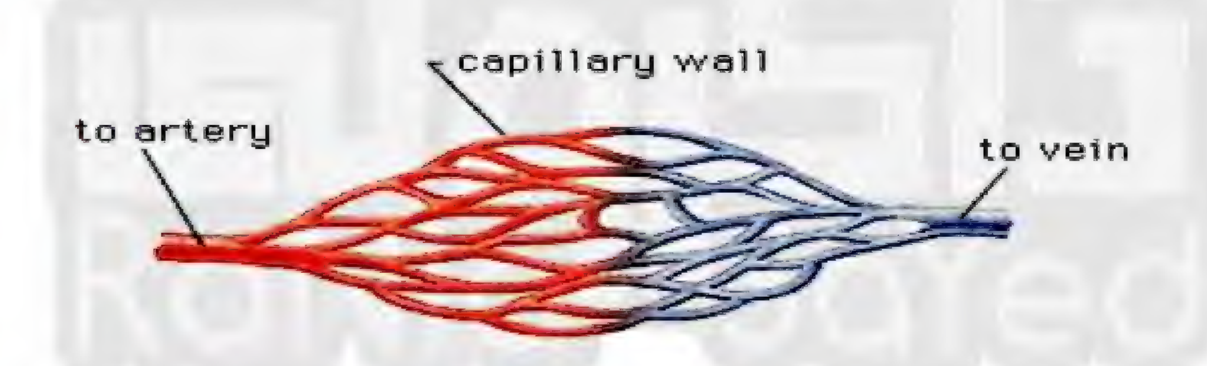
3-There is a wall that separates between the right side and the left side of the heart

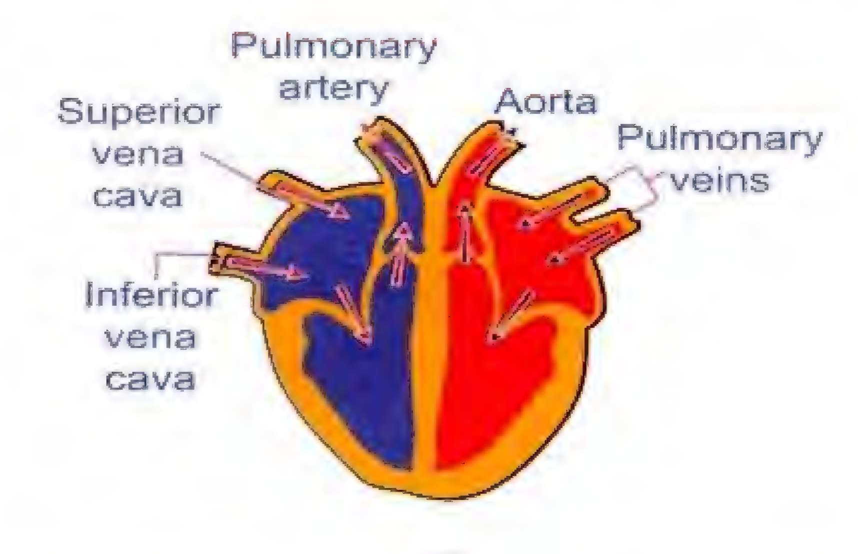
4-There is a **valve** between each atrium and ventricle .

## 2- Blood vessels

They are a network of pipeline spread all over the body where the blood flow .



| *Point of comparison* | *Arteries* | *Veins* | *Blood capillaries* |
|---|---|---|---|
| ***Thickness*** | They are *thick* blood vessels | They are *thin* blood vessels | They are a network of tiny blood vessels with *very thick* wall |
| ***Location*** | They come out(emerge )from two ventricles | They open in the two atria | -They connect the ends of the arteries and the beginning of the veins<br>-They are located within the tissues and around the cell |
| ***Function*** | They carry the blood from the heart to all the body | They carry the blood from all the body parts to the heart | Their thin wall allow the blood to deliver food and oxygen to the cells And carries carbon dioxide and wastes. |
| **Type of blood** | All arteries carry blood rich in *oxygen* except *pulmonary artery* which carries blood rich in *carbon dioxide* | All veins carry blood rich in *carbon dioxide* **except** *the pulmonary veins* which carries blood rich in *oxygen*. | |
| **Examples** | **- Aorta.**<br>**- Pulmonary**<br>**- artery** | - Pulmonary veins.<br>- Superior vena cava and inferior vena cava. | |

## 3- Blood

-It is a red liquid.



**Blood Consists of**

- Red blood Cells
- White bloodCells
- Blood Platelets
- Plasma

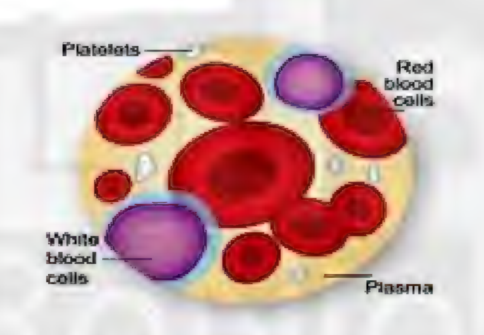
| 1- Red blood cells(RBC's): | 2- White blood cells ( WBC's): | 3- Blood platelets | 4- Plasma |
|---|---|---|---|
| They are red cells without nuclei. | They are white cells with different forms of nuclei. | They are small cell fragments (parts). | It is a yellow watery fluid in which all the blood components are suspended. |
| ** Functions:-* They carry Oxygen gas from the lungs to all the body cells. - They carry carbon dioxide gas from all the body cells to the lungs | ** Function:* They defend the body against microbes by attacking them. | ** Function:* They help in coagulation of blood ( Formation of blood clot), so they help in healing wounds | **Function:* 1- It carries the needed food substances to the body cells 2- It carries the harmful wastes that formed in the cells to another cells to get rid of them |

# *The functions of blood*

**1- The transfer or delivery of materials to all the body cells:**

**A- The red blood cells**: carry oxygen and carbon dioxide

**B-Plasma :** transports food, vitamins, salts and harmful






**2- The defence and protection of the body, where:**

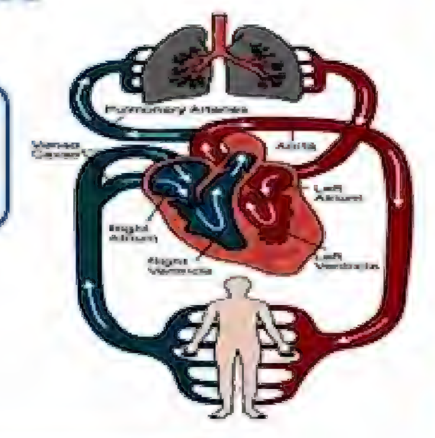
**A- White blood cells:** attack microbes that cause diseases to human.

**B- Blood platelets**: help in healing wound.

# Blood Circulation

***Blood circulation**:

It is the path of blood throughout the body.



## Steps of it:

1- **The right atrium** receives blood carrying **$CO_2$** from all body parts by ***veins***(Superior vena cava and inferior vena cava) into the **right ventricle** .

2- The right ventricle contracts pumping the blood into **pulmonary artery** to the lungs where **$CO_2$** is exchanged with **$O_2$.**

3- The blood rich in **$O_2$** returns to the left atrium by **veins**, then it flows into the **left ventricle**.

4- The left ventricle contracts pumping the blood rich in **$O_2$** into **aorta** artery to all the body parts.



## Types of blood circulations

**a. The minor (pulmonary) blood circulation**

It is the blood circulation between the heart and the two lungs.



**b. The major (systemic) blood circulation**

It is the blood circulation between the heart and all the parts of the body



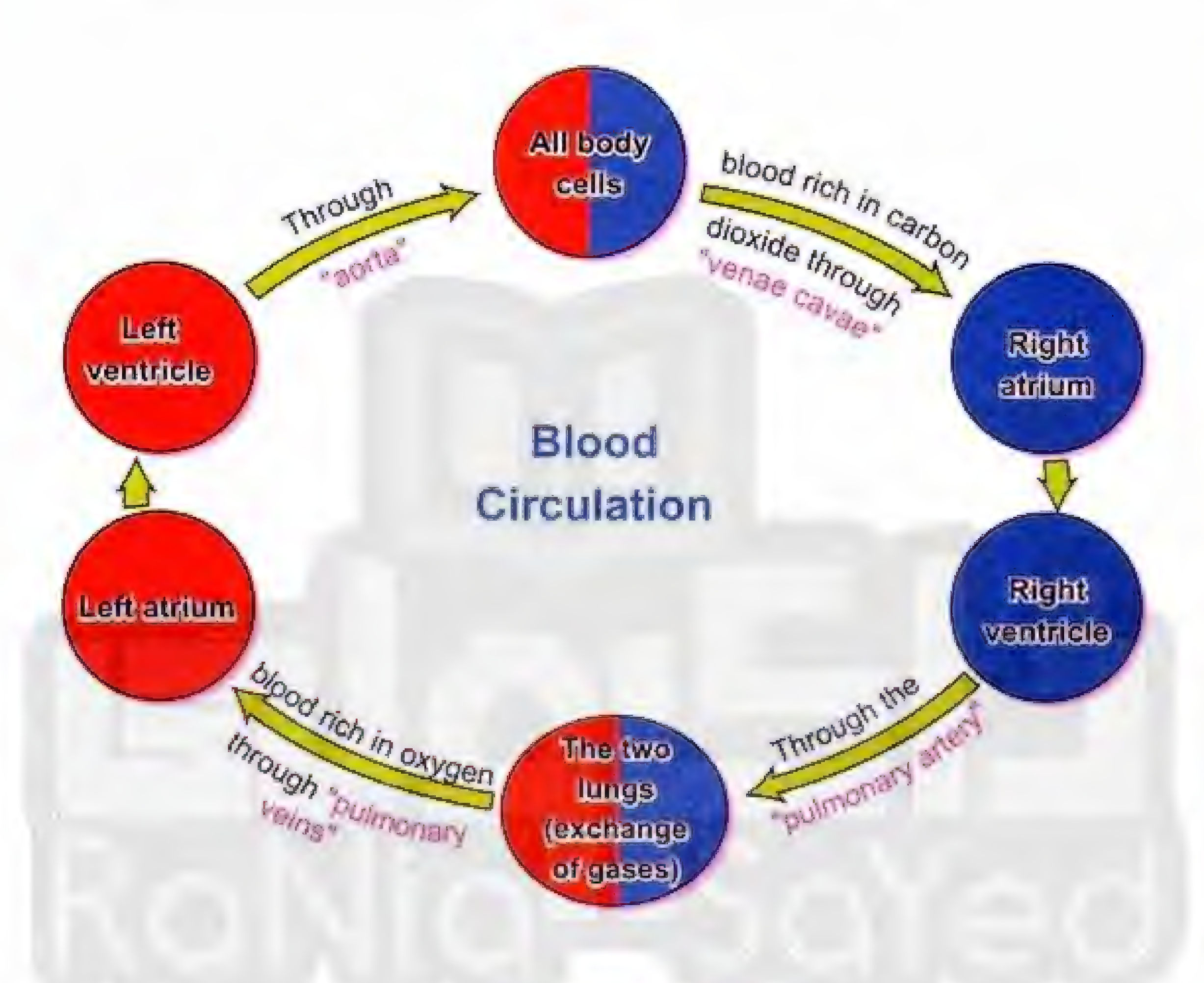
**Notes:**

1- The heartbeats push the blood in the arteries. causes the pulse in wrist.

2- The no. of heart beats at rest is 70 beats /minutes.

3- During exercises the no. of heartbeats increases to supply body cells with oxygen and food to produce more energy.

# "Summary for blood circulation"






## How to keep the circulatory system healthy?

1-**Keep exercising** to strengthen the heart muscle and to activate the blood circulation.



2. **Eat more fresh and clean vegetables** and **fruits** And Eat healthy & balanced food. .



3-Drink an appropriate (a suitable) amount Of clean water every day



4 -**Avoid smoking and smokers**, where smoking

A-Harms the heart    B-Weakness the blood circulation



**5-when you wounded:**

A-Try to stop the bleeding

B-Clean the wound and treat it.



6-**Avoid exposure to infections and accidents**



# Evaluation (1)
## (The heart)

### 1) Complete:

1-Human circulatory system consists of ……………………,……………… and …………………………………………….

2-The system that transports the digested food, oxygen and water to all the body cells is called ……………………………………….

3-Heart is a …………………………organ nearly having the size of the ………………………

4-Heart is located inside the chest cavity between the ………………………

5-The circulatory system transports …………………………, …………………… and ……………………… to all the body cells.

### 2 Look at the opposite figure then answer

**I) Label the figure :**

1- ………………………………

2- ………………………………

3- ………………………………

**II) The function of this organ is** ………………………………

………………………………………………………………………

# Homework(1)

## 1 Complete following statements:

1- Each side of the heart consists of …………… chambers, the upper one is called ……………… and the lower one is called……………

2-The two sides of the heart are separated by …………………………………….

3-In each side of the heart, there is a ……………………. to prevent the blood from returning back to the ………………….

4- The heart chambers …………………..and ………………………

## 2 Choose:

1- All the following are from the components of the circulatory system except……………
(heart – blood vessels – stomach –blood)

2-The circulatory system transports the ………… inside the body.
(digested food and water – wastes – respiratory gases – all the following)

3-The heart is a …………………… muscular organ.
(hollow – solid – liquid – gas)

4-There is a ……………. between the two sides of the heart to prevent the mixing of blood in both sides.
(valve – wall – atrium – vein)

## 3 Mention the function of the following:

1-Heart :………………………………………………………..

2-Valve :………………………………………………………..

# Evaluation(2)

(Blood vessels )

## 1 Complete:

1- The blood flows inside a network of pipelines called ……………… .

2-There are …………… types of blood vessels which are …………….
………………….and…………………………

3-………………… ends with blood capillaries , while ……………….begin with blood capillaries.

4-………………………… begin at the heart and end at the body cells, while …………… begin at the cells and end at the heart.

5-The tiny blood vessels which connect between the ends of arteries and the beginning of veins are called………………………………

## 2 Choose :

1-Arteries carry blood …………….
(to the heart – away from the heart – towards and away from the heart)

2-………… Carry blood to the heart.
(Veins – Platelets – Arteries– Blood capillaries)

3-………………….. begin with blood capillaries.
(Arteries – Veins – RBC's – WBC's)

4-…………… carry blood rich in oxygen.
(Veins – Arteries – Blood capillaries – White blood cells)

5-……………. begin large and wide at the heart.
(Arteries – Blood platelet – Veins – Blood capillaries)

# Evaluation (3)

## 1) Complete:

1- All arteries carry blood rich in oxygen except the……………………

2- All veins carry blood rich in carbon dioxide except the

3- The atria receive blood from …………………… , while the ventricles push blood into …………………………

4- ………………………………… are blood vessels that carry blood from different body parts to the ………………………….

5- The blood vessels which open in the two atria are called ……………

6- Veins begin in the form of ………………………… at the cells.

7- The thin wall of blood capillaries allows blood to deliver ………………………. and………………… to ……………

## 2 Choose :

1-…………… carry blood rich in oxygen.

(Veins – Arteries – Blood capillaries – White blood cells)

2-…………… begin large and wide at the heart.

(Arteries – Blood platelets – Veins – Blood capillaries)

3-Aorta is ………………….

(the largest vein – the largest artery – the smallest artery – the smallest vein)

4-The smallest blood vessels in the body are the…………….

(arteries – veins – capillaries – no one of these)

\

# Homework(3)

## (The blood)

### 1 Complete follow instatements:

1-Human blood consists of ……………………, ………………………., ……………………..and……………………

2-Red blood cells have no……………………..

3-White blood cells have …………………….. of different forms.

4-………………………… are small cell fragments.

5-…………………………. is a yellow watery fluid.

6-………………………blood cells carry oxygen and carbon dioxide inside the body .

### 2 Choose

1-The function of red blood cells is ……………………..

(blood clotting – carrying oxygen – carrying carbon dioxide)

2-The digested food is transferred from the digestive system to the body cells by……….

(plasma – white blood cells – red blood cells – platelets)

3-All the following are from the components of the blood except ………………………

(red and white blood cells – platelets – blood capillaries– plasma)

4-The blood is liquid due to the presence of the …………..

(platelets – plasma – blood vessels – heart)

## 1 Mention the function

1-Blood:

……………………………………………………………………

2-Red blood cells

……………………………………………………………………

3-white blood cells

……………………………………………………………………

4-blood platelets

……………………………………………………………………

5-plasma:

……………………………………………………………………

## 2 Compare between :

**Red blood cells and white blood cells :**

| Red blood cells | White blood cells |
|---|---|
| ------------------------- | ------------------------- |
| ------------------------- | ------------------------- |
| ------------------------- | ------------------------- |
| | |




## 1 Match

| ( A ) | ( B ) |
|---|---|
| 1- The left ventricle | a) allows blood to flow only from atrium to ventricle . |
| 2- The right atrium | b) pumps the oxygenated blood to aorta |
| 3- Valve | c) receives deoxygenated blood from vena cava . |

## 2 Put (√ ) or (x)

1- The wall of the right ventricle is thicker than that of the left one (    )

2- Blood capillaries are considered as the beginning of veins (    )

3- The right atrium receives blood out of the arteries (    )

4- When the left ventricle contracts it pumps blood into pulmonary artery (    )

5- When the right atrium receives blood from the vena cava, the left atrium receives blood from pulmonary veins. (    )

# Homework(4)

## 1 Complete following statements:

1-………………… ventricle pumps blood to lungs while the left ……………. pumps blood to all body parts.

2-The path of blood throughout the body is known as the……………

3-The blood circulation between the heart and lungs is known as the ………..……………or ………………………….

4-The circulation between the heart and other parts of the body is known as the ……………………………… or ……………………………

5-During making a muscular effort the number of your heartbeats………

6-you must keep exercising to…………………….and………………

7-the number of the heartbeats is ………… per minute.

## 2 Choose

1-The blood passes from atria to ventricles through………………
(the veins – the valves – the arteries – a wall)

2-The right side of the heart contain blood rich in …………… gas.
(oxygen – carbon dioxide – nitrogen – water vapour)

3-The left ventricle pumps blood to………………..
(hands – lungs – heart – all the body cells)

4-……………………….is the blood circulation between the heart and all the parts of the body .
(systemic blood circulation-pulmonary blood circulation –artery )



Unit Two

LESSON 2

# Excretion and Human urinary system

## Excretion

It's the process by which the body get rid of excretory materials

**The types of wastes that expelled outside the body**

A) Solid wastes

B) Excretory materials (cell wastes)

## Solid Wastes

They are the indigested food that stored in the large Intestine until it passes out of the body.



## Excretory Materials

They are the waste materials that produced inside the body cells and the body must get rid of them.

## The excretory materials are:



1. Carbon dioxide
2. Nitrogenous wastes
3. Excess salts

**Carbn dioxide**

-It is produced with water vapour when the body cells burn the digested food by oxygen to produce energy.
- We can get Carbon dioxide & Water vapor through The two lungs.



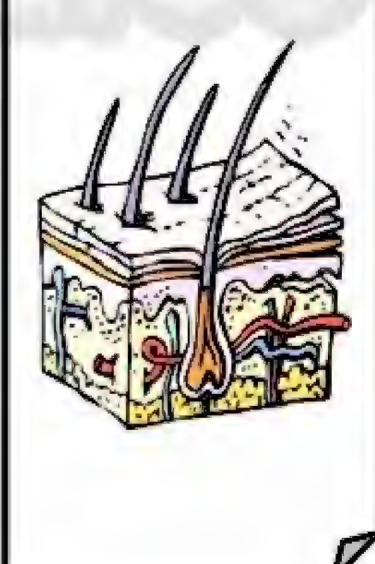
**Nitrogenous**

- They are produced from breaking down of proteins
- The nitrogenous wastes are *urea* and uric acid. - We can through the urinary system



**Excess salts:**

- The body gets rid of the excess salts by dissolving them in the excess water.
- We can get rid of them through the urinary system and *skin*.

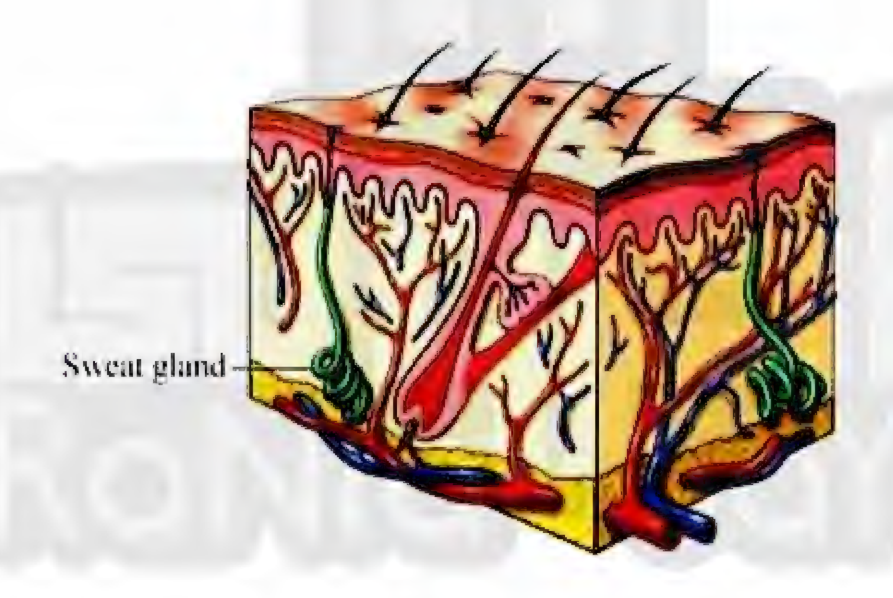


**-The skin is one of the excretory organs**

**- Because the skin gets rid of some excess salts and excess water in form of sweat.**

**Sweat glands:-**

Are special glands that found in the skin to get rid of sweat.



# The urinary system

- It'thesystem that clarifies blood from the nitrogenous wastes. (urea, uric acid) , excess water and salts .

## Its location

It lies inside the abdominal cavity near the back bone .

## Its function

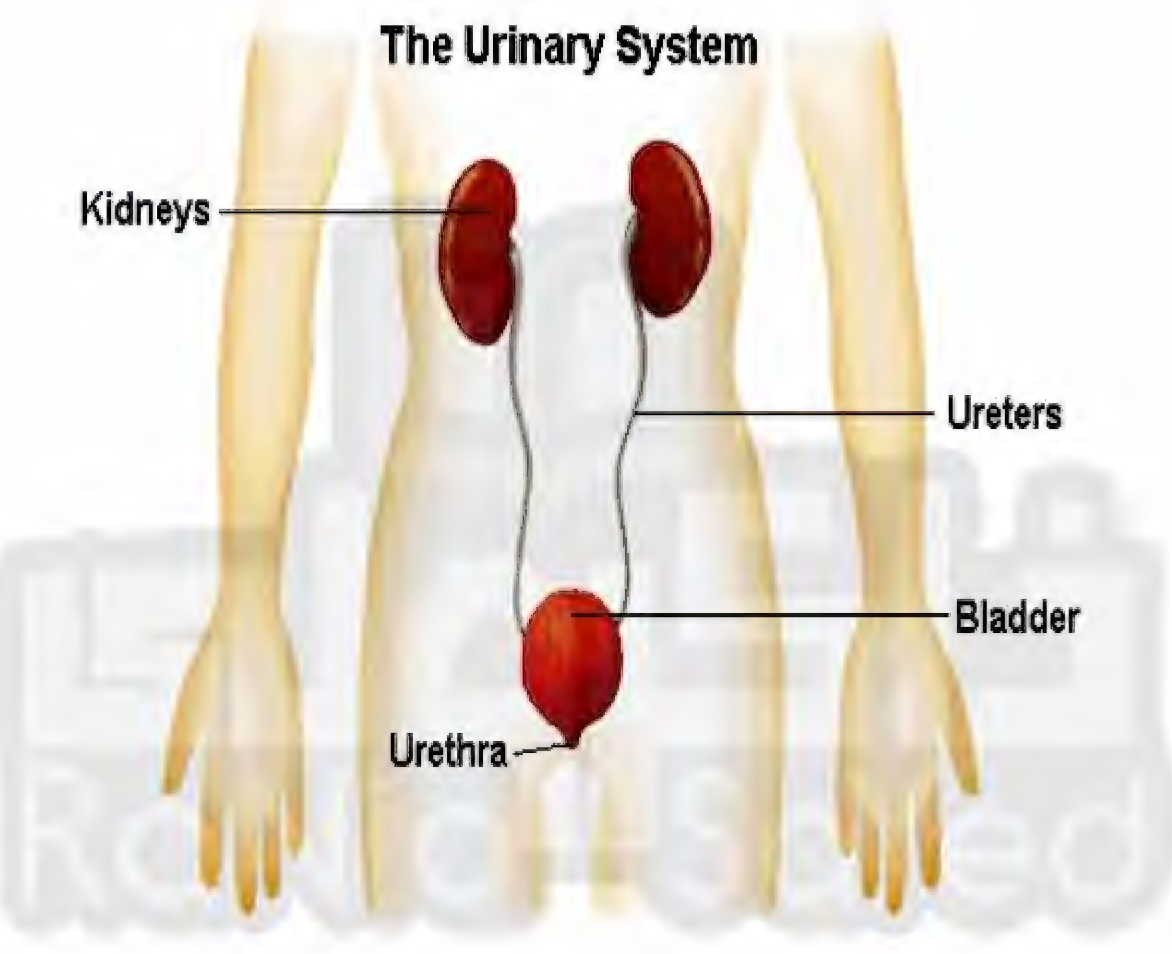
1- It filters the blood from excess salts, urea, uric acid that dissolved in water

2- It expels these wastes outside the body in the form of urine

## Its structure

**It consists of**

- The two kidneys
- The two ureters
- The urinary bladder

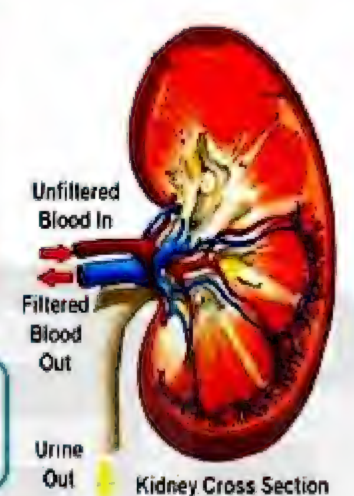

The Urinary System
Kidneys
Ureters
Bladder
Urethra

**1- The two kidneys**

* They are the most important organs of the urinary system

**Shape**

They are bean – shaped organs




**Location**

Located on both sides of the back bone

**Function**

1-Filtration of the blood from some wastes as urea, uric acid, excess salts

2-Getting rid of these wastes in the form of urine

* Each kidney contains about one million of minute tubules that filler wastes from blood



## 2-The two ureters

They are two narrow tubes that connect the two kidneys with the urinary bladder

**Function**

They transfer urine from the two kidneys to the urinary bladder.

## 3-The Urinary bladder

It's a balloon sac like

**Function**

It stores the urine temporarily until it is released outside the body through urethra.

## 4-Blood vessels

-Carry blood to and from the kidneys

## 5-Urethra

-It is a tube which extends from the urinary bladder and opens outside the body

-It allows the urine to pass outside the body

# How to maintain the urinary system healthy?

1) Drink appropriate amount of water daily especially in summer.



2) Don't keep urine for long periods



3) Eat healthy and balanced food low in salt




4) Avoid urinating in irrigation canals
to protect us from **schistosomiasis disease** (bloody urine)





# Evaluation

## 1 Complete following statements:

1- The urinary system is located inside …………… cavity.
2- The urinary system filters the blood from …………… , ……………… and ………………
3- The waste materials that are produced from breaking down of proteins are known as …………… which are …………… and ………………
4- Sweat glands get rid of ……………… and ………………. In form of sweat.
5-The types of excretory materials are :…………….
,…………………….and …………………………..

## 2 Correct the underlined word :

1- Urea and uric acid are produced from breaking down of **starch**.
………………………………………………………………………………
2- Excess water and salts are from **solid wastes**.
………………………………………………………………………………
3- The **urinary system** is responsible for producing sweat.
………………………………………………………………………………

## 3 Look at the opposite figure then answer

1-…………………
2-…………………
3-…………………

(1)
(2)
(3)

# Homework(1)

## 1 What's meant by :

a- Solid wastes ?

........................................................................................................................
........................................................................................................................
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b- Excretory wastes ?

… … … … … … … … … … … … … … … … … … … … … … … … … … … … … … …
… … … … … … … … … … … … … … … … … … … … … … … … … … … … … … …
… … … … … … … … … … … … … … … … … … … … … … … … … … … … … … …

## 2 Write the scientific term :

1- The waste materials that are produced inside the cell.

[… … … … … … … ...]

2-The system that clarifies blood from excess salts, urea and uric acid.

[… … … … … … … ...]

3- The fluid which is produced by the kidneys and contains harmful substances. [… … … … … … … ..]

4- The indigested food that stored in the large intestine until it passes out of the body. [… … … … … … … ..]

## 3 Choose :

1- …………… is the narrow tube that allows urine to reach the urinary bladder.

a- urethra b- ureter c- kidney d- artery

2- The artery in the urinary system carries ……………

a- pure blood b- blood containing wastes

c- blood rich in carbon dioxide d- blood capillaries

3- …………… is responsible for storing the urine temporarily.

a- ureter b- kidney c- urinary bladder d- urethra

4- …………… is a special type of gland that produces sweat.

a- salivary glands b- liver c- sweat gland d- skin

# Homework(2)

## 1 Complete following statements:

1- Kidneys are located on both sides of the ……………

2- The …………… stores the urine until it is released outside the body.

3- The blood enters the kidney through …………… while it leaves them through ………

4-The kidney is a …………… shaped organ.

5- Carbon dioxide —Expelled From→ ……………………………

6- Excess salt (sweat ) —Expelled From→ ………………………….

## 2 Choose

| (A) | (B) |
|---|---|
| 1- The kidney | a- stores the urine temporary |
| 2- The ureter | b- gets rid of the excess salts |
| 3- The urinary bladder | c- filters blood from wastes |
| 4- The skin | d- is a narrow tube that transfer urine from the kidney to urinary bladder |
| 5- The two lungs | e- removes carbon dioxide from the body |

## 3 Mention the function

1) Ureter : ………………………………………………………..

2) Kidney : ……………………………………………………….

3) Urinary bladder : …………………………………………….



Unit three

LESSON 1

# Soil components

**Soil**

It is a thin non compacted upper layer covers the Earth crust



**There are different types of soil that are different in:**

**1- Color**

**The color of soil helps scientists to identify the elements and minerals inside it.**

**2- Texture**

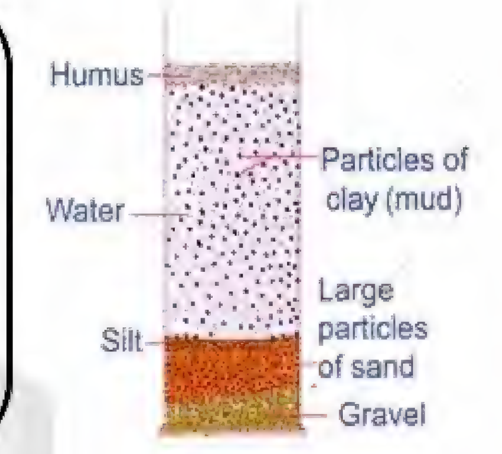
**The texture of soil is smooth or granular or rocky.**




***The variation in types of soil depends on the type of rocks and minerals found inside them.***

# A)Soil components

1-Pieces of rocks
( as sand , clay , minerals and gravels )
2-Water
3-Air
4-Silt
5-Humus




**The main components of soil are**

**1- sand**

**2- humus**

**3-clay.**



**Some of soil components :**

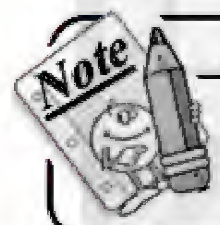
a) **Pieces of rocks.** b) **humus .**

**Humus:**

-It is the decayed remains of animals and plants mixed with the soil components and its color is dark brown or black.

**Pieces of rocks:**

The variation in types of soil depends on types of rock and minerals. Rocks are the main components of sand and clay.




***Soil*** is the main component to the environment as it is necessary for all living organisms ( plants , animals and humans ).

# B) Importance of soil

1) Plants take minerals and nutrients from the

2)Animals eat plants that depend on the soil.



3)Some animals make their homes in the soil .

4) Man eats plants and animals that depend on the soil.

- There are many factors break down rocks forming soil which are :

1- Water rushing  2- winds  3- Heat and rains

**Ex:** The origin of the soil of Egypt is the rocks of the Ethiopian plateau.



## Soil layers:

1-Top soil layer.

2-Lower soil layer.

3-Rocky layer.

# 1) Top soil layer

**Roots of the plants:**



**Their importance for plants:**

1-They fix the plants in the soil

2-They take water and nutrients from the soil.

**Their importance for soil:**

1-They help the soil to be cohesive.

2-They are converted to humus after death and add to the soil nutrients

They prevent the soil erosion from happening quickly.







**Leaves of the plant:**

-They turns into humus when they fall on soil

3-organisms as



**A)Ants and other insects**

* They exist in top soil layers and dig tunnels in the soil to make nests and lay eggs .
* They changed to humus after death .

***B)Earth worms and some spiders :***

-The soil is considered shelter for earth worms and some spiders . .

***-Their important for plants***

Earth worm and spiders help in growth of plant roots .





4-Small pieces of rocks and humus




- It lies beneath the top layer
-It does not have much humus

## 3) Rocky layer

-Their upper layer contain pieces of rocks
- Their lower layer contain solid rocks .

# Evaluation

## 1 Complete following statements:

1-The origin of the agricultural soil in Egypt is the ………………plateau.

2-The loose upper layer that covers earth crust is called …………………

3-…………..is the main component of soil that its color is black .

4-The texture of soil is…………..or……………or……………….

5-The pieces of rocks is composed of ………….,………………and ………

## 2 Give reason for :

1- Humus is important for soil.

……………………………………………………………………………..

2- Roots are important for plants.

……………………………………………………………………………

## 3 What happens when :

1- There is no roots for plants in soil .

……………………………………………………………………………

2- There aren't microorganisms in soil .

……………………………………………………………………………

# Homework

## 1 Complete following statements:

1-The pieces of rocks may composed of…………………. , …………………….. and ……………………………….

2-Water,………… ,……………and……………are from the soil components .

3-………………..is non- compacted superficial layer which cover …………

4-Humus affect the ……………of the soil .

5- …………… is the main component of the environment .

6-The breaking down of rocks produces ……………. , ………… gravel and …………

7-…………… affects the color of soil .

8-……………. adds nutrients to soil .

9- Soil is being cohesive by…………………

## 2 Write the scientific term :

1- The remains of the decayed organisms. (………………….)

2- The origin of the Egypt's soil . (………………….)

3- It is the decayed remains of animals and plants mixed with the soil components and its color is dark brown or black . (…………………)

4- A soil component that is composed of minerals , sand , gravel and clay (………………….)

5- Black material that exists in the top soil layer . (………………….)




LESSON 2

# Types and properties of soil

- **Types of soil**

## Sand soil

- It is the soil that composed mainly of sand particles, a small amount of clay and silt, and rarely contains humus.

## Silt soil

- It is the soil that composed of a mixture of gravel, sand, clay, silt and more humus.

## Clay soil

- It is the soil that composed mainly of clay and silt particles, and a small amount of sand and humus.

## Properties of soil:

| Properties | Clay soil | Sand soil | Silt soil |
|---|---|---|---|
| ***Composition*** | Mainly clay and silt . Small amounts of sand particles and humus . | - Mainly sand particles<br>- Small amounts of clay and silt .<br>- Rare humus. | - Mixture of gravel , sand , clay and silt<br>- More humus . |
| ***Color*** | Dark | Yellow | Grey |
| ***Particle size*** | Small | Large | Medium |
| ***Drainage of water*** | Slow | Fast | Medium |
| ***Aeration*** | Poor | Good | Medium |
| ***Compactness*** | Strong | Weak | Medium |
| ***Fertility*** | Fertile | Less fertile | High fertile |
| ***Suitable Plants grow in it.*** | Cotton , rice , sugar cane , wheat and many vegetables | - Tuber plants as potato and sweet – potato<br>- Peanut , cactus | Strawberry, lemon and pomegranates . |




1) When the soil is well aerated or its particles are non-compacted, its ability to drain water increases and vice versa

2) Fertility:

Depends on amount of humus in soil .



# Evaluation

## 1 Complete following statements:

1- ……………….soil is composed mainly of clay , silt particles , a small amount of sand and humus .

2- ………………. soil is composed mainly of sand particles and a small amount of …………………… .

3- ………………. soil contains more humus , while …………..soil contains rarely humus

4- ……………….soil is composed of a mixture of equal amounts of gravel sand , clay , silt and a large amount of humus .

5- The fertility of any soil depends on the percentage of………………… .

## 2 Arrange the different types of soil

a- According to the size of particles .( Ascendingly )

……………………………………………………………………………
……………………………………………………………………………

b- According to the drainage of water .( Descending )

……………………………………………………………………………
……………………………………………………………………………

c- According to the fertility .( Descending )

……………………………………………………………………………
……………………………………………………………………………

d- According to the compactness .( Ascendingly )

……………………………………………………………………………
……………………………………………………………………………

e- According to the aeration .( Descending )

……………………………………………………………………………
……………………………………………………………………………

# Homework



## 1 Cross the odd word out

1- Potatoes – sweet potatoes – cotton – cactus .

2- Strawberry – pomegranates – oranges – peanut.

3- Rice – wheat – potatoes – sugarcane .

## 2 Give reasons for:

1- Sand soil has yellow color .

…………………………………………………………………………

…………………………………………………………………………

2- The clay soil is poorly aerated .

…………………………………………………………………………

…………………………………………………………………………

3- Silt is the most suitable soil for cultivation .

…………………………………………………………………………

…………………………………………………………………………



# Model (1)

**Complete the following sentences:_**

1- ……………..…… is used to decreases the friction force between the internal parts of machines.
2- White blood cells attack ………………… that cause………….to human.
3- ……………….soil is highly fertile, while ………………soil is highly compact.
4- The ureters carry ……………. from the kidneys to the………………..

**Write scientific term:_**

1- A friction force between water and the moving object through. (………………………….…..)
2- The loose superficial layer of Earth's crust. (…………………………..…..)
3- The blood circulation between the heart and the lung. (……………………………….)
4- A yellow watery fluid in which the blood cells float. (……………………………….)

**Give reasons for:_**

1- The train has a streamlined shape.
………………………………………………………………………………
2- The two sides of the heart are separated.
………………………………………………………………………………

**What is the importance of:_**

1- Veins.
………………………………………………………………………………
2- Humus.
………………………………………………………………………………

**Choose the correct answer:_**

1- The human body gets rid of carbon dioxide gas through the ………
a. Heart. b. lungs. c. Valves.
2- The fish has streamlined shape to decrease ……………………
a. Air resistance. b. Water resistance. c. Speed.

# Model (2)

**Complete the following sentences:-**

1- Circulatory system transports ……………………,………………………and water to all the body parts.

2- Blood platelets form ………………which help in healing………………

3- Friction force affects in the …………………direction of the ……………….

4- ……………..soil contains more humus, while ………..soil contains rare humus.

**Write scientific term:_**

1- The cells that have no nuclei. (…………………………….)

2- Blood circulation between the heart and the two lungs. (…………………………….)

3- The remains of the decayed organisms. (…………………………….)

4- The fluid which is excreted by kidneys. (…………………………….)

**Choose the correct answer:_**

1- ………………carry the blood to the heart.

a. Veins.
b. Platelets.
c. Arteries.

2- …………..plant is suitable to be cultivated in sand soil.

a. Wheat.
b. Rice.
c. Potatoes.

**Put (√) *or* (*x*):_**

1- White blood cells defend the body against microbes. ( )

2- Eating food rich in fats activates the circulatory system. ( )

3- The two lower chambers of the heart are called two atria. ( )

4- Oil is used to decrease the friction force. ( )

5- Earthworm is useful for the soil. ( )

# Model ( 3 )

**Complete the following sentences:_**

1- Urinary system is located inside the …………………….cavity.

2- When the surface area of moving body increases, the friction force……………………

3- The sand soil has ……………………………color.

4- The friction force between air and the body moves through is called ……………………………

**Write the function of the following:_**

1- Ball bearing.

………………………………………………………………………………

2- Platelets.

………………………………………………………………………………

3- Urinary bladder.

………………………………………………………………………………

**Give reasons for:_**

1- Damage of kidneys causes death.

………………………………………………………………………………

2- The walls of blood capillaries are thin.

………………………………………………………………………………

**Correct the underlined words:_**

1- The **lung** is a muscular organ in the size of fist.

2- The **heart** is responsible for producing sweat.

3- Urea and uric acid are produced from breaking down of **starch**.

4- **Sand** soil is the highest fertile soil.

**Write scientific term:_**

1- A thin non compacted layer that covers the earth's crust.

(………………………………………)

2- The narrow tubes which carry urine from kidneys to urinary bladder.

(……………………………………..…)